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海洋深層水利用学会

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“Oyster Cultivation Method Utilizing Deep Ocean Water” Patent Acquisition

Kyoko Washiashi （President, GO Farm Inc.）

Our parent company, General Oyster Inc, of which we are a wholly owned subsidiary, acquired a patent for oyster cultivation method (purification method) utilizing deep ocean water (DOW). (Japanese Patent No. 6240037）

The General Oyster Group was founded as an oyster bar restaurant in 2000, and currently operates 30 oyster bars throughout Japan. It operates four group companies and one division at five domestic sites with six areas of focus. (Fig. 1）

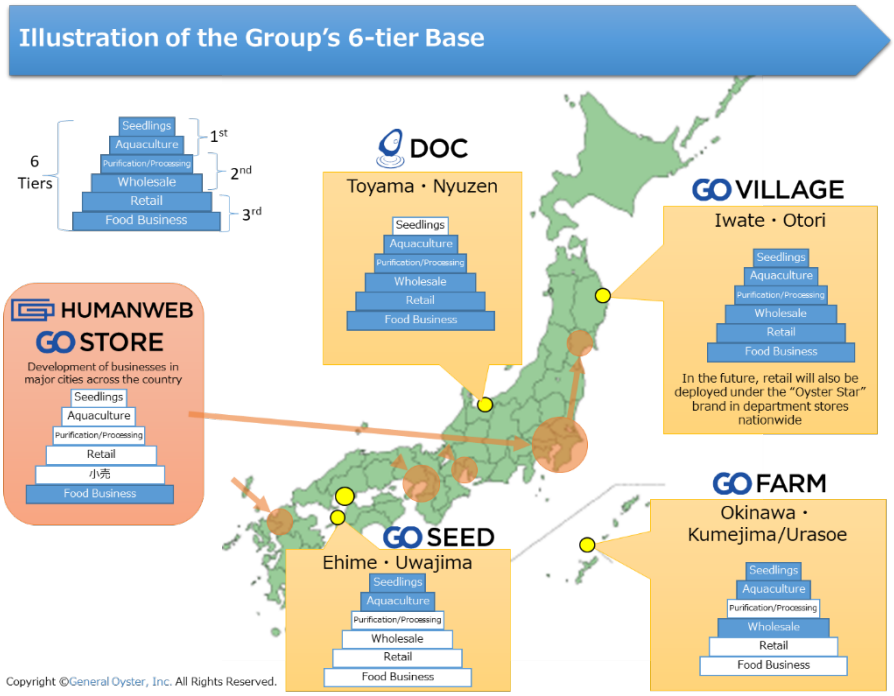

Fig. 1. Our Six-tier Industry Base

In December 2006, during a Norovirus outbreak, we were operating oyster bar restaurants, and fear of tainted oysters led to management difficulties. We found our path forward as ensuring our customers had “safe and secure” product through our own hands.

In September 2007, we opened a purification center for oysters using UV sterilization in Kure City, Hiroshima, followed by a purification center utilizing DOW in Nyuzen Town in Toyama Prefecture in August 2014 to further enhance safety. (Fig. 2）

The patented DOW (purification) method was found to equal or exceed oyster purification by ultraviolet sterilized surface seawater following the standards for raw oysters specified by the Food Sanitation Law in the removal rate of bacteria from livestock. Furthermore, the eutrophic nature of DOW was found to support freshness and mineral composition in fresh oysters. Thus, according to the present invention, it is possible to reduce the risk of virus and bacterial contamination, and to purify oysters for safety while maintaining freshness and mineral composition.

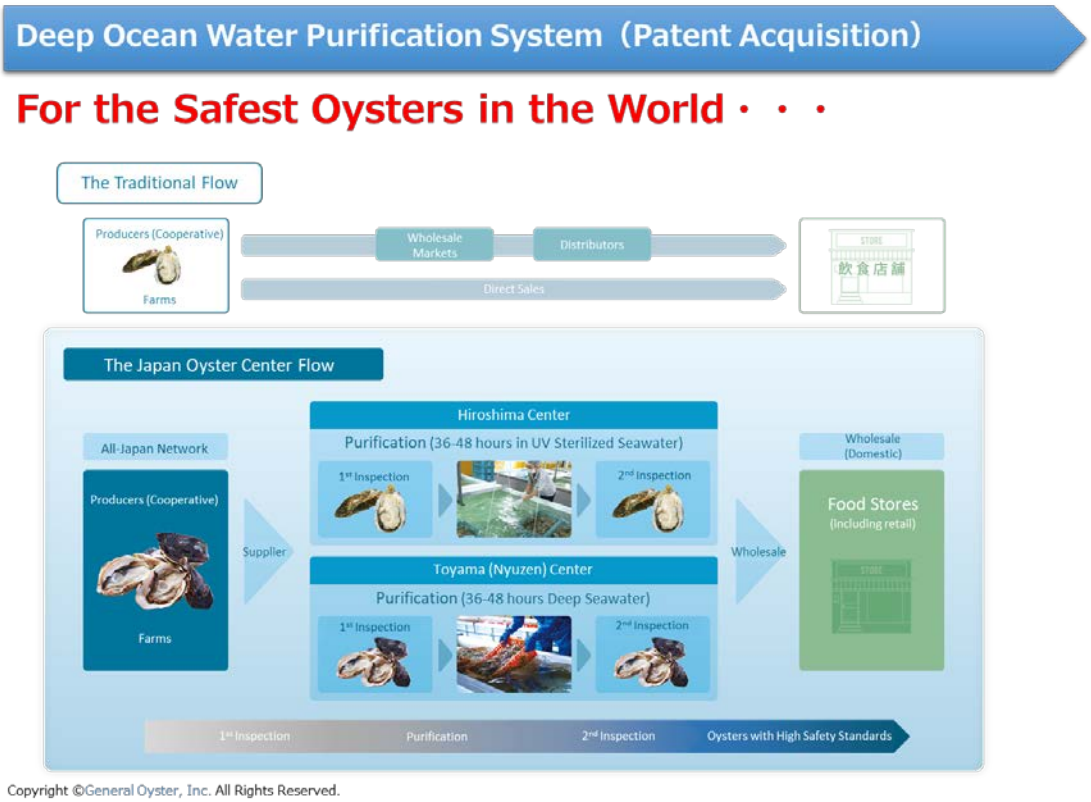

Fig. 2. Distribution Structure

At the 2016 DOWAS Convention in Toyama, we enjoyed visits to our group center, and regarding the acquisition of this patent we would like to thank Chairman Masayuki Takahashi and all members for your continued support and consideration.

We hope to contribute to the creation of a new future through the pursuit of safety through persistence and use of DOW with oysters. We would also like to express our sincere wish for the continued success of this society, and thank you for the opportunity to report to you.

DOW Use Promotion Committee 2017 Hokkaido Convention Report

Katsuhisa Yamada (DOWAS Use Promotion Committee)

This year, the Use Promotion Committee held the “Utilization of Deep Ocean Water in Hokkaido” round table meeting of DOW users at the Rausu Town Community Center 2F large hall. Despite the early start of 3pm on October 11 (Wednesday) on the eve of DOWAS, approximately 40 stakeholders gathered. Representatives from Rausu Town, Iwanai Town, and Yakumo Town took part as panelists from the three deep seawater intake areas in Hokkaido with Mr. Akio Nishikawa (Econix Inc.) coordinating.

The first topic, from the viewpoint of DOW utilization, was an overview of the current state of utilization in the field of fisheries. Mr. Hideki Yamashita of the Rausu Town Office noted that currently 90-95% of DOW capacity is used in fisheries. Mr. Kanaya Toyokazu of Iwanai Town reported that 90% of use is by fisheries. With Mr. Tsutomu Kuromaru of Yakumo Town reporting that most is also used in fisheries, it became clear that the main focus of DOW use in Hokkaido today is in fishery. Interestingly, Yakumo Town reported use of seawater in transporting live fish such as scallops in order to maintain freshness, and in Iwanai town, they heat DOW for farming with heat exchangers and the plentiful hot spring water, two methods that advance the nature of DOW utilization technology in Hokkaido. In each region, the use of DOW aside from fishery use is also being actively studied, with discussion of the challenges in making use of the agriculture and livestock characteristic of Hokkaido. In Rauso Town, cultivation of onions in dairy fields, and salt tomato and melon in Iwani Town was conducted. There was also discussion of research carried out in collaboration with local agriculture universities. Yakumo Town reported on the progressing commercialization of “the most expensive pumpkin in Japan” made with DOW. In addition, Mr. Morose Takashi of the DOW User Association highlighted the current situation in use of saltwater in processing of cosmetics, soft drinks, etc.

Finally, in considering issues in the utilization of DOW at the above areas, as there are limits to the efforts that can be made at the town level, it was recognized that active support of efforts made by DOW businesses and support in acquiring demonstration data on the effectiveness of DOW seawater is needed for Hokkaido, which ended the talks in a meaningful way.

Fig. 1. Panel Discussion

The 21st DOWAS National Convention in Hokkaido 2017 Report

Katsunori Shimizu (Chairman of DOWAS Convention Planning Committee)

The "DOW 2017 Hokkaido Conference," was held on October 12 and 13, 2017 at the "2nd floor large public hall" at Rausu Town, Hokkaido. The outline of the event follows.

【Organizer】DOWAS

【Supporters】MEXT, Fisheries Agency, Hokkaido Development Bureau, Ministry of Land, Infrastructure, and Transport, Hokkaido Prefecture, Rausu Town, Yakumo Town, Iwanai Town

【Sponsor】Shiretoko Rousu DOW Utilization Council

【Research Distribution and Planning Committee】

Chair	Katsunori Shimizu (Shimizu Co.)
Committee	Manabu Shirashi (Marino Forum 21)
	Hiroyasu Goto (Shizuoka Pref. Fisheries Research Institute)
	Asako Onuki (Association of Marine Industry Institute)

【Executive Comittee】(Venue Committee)

Chair	Akira Nagano (All Japan Fishing Port Construction Association Institute)
Vice Chair	Minoru Minatoya (Rausu)
	Katsuaki Iwamura (Yakumo)
	Yuji Kamioka (Iwanai)
Members	Mitsuru Hirata (Rausu)
	Hideki Yamaishi (Rausu)
	Ryo Nakano (Rausu)
	Toyokazu Kanaya (Iwanai)
	Suzuki Takayuki (Iwanai)
	Haruo Tamura (Yakumo)
	Tsutomu Kuromaru (Yakumo)

Fig. 2. Opening of the 21st Convention

【Agenda】

Opening Remarks

Masayuki Takahashi (DOWAS President・Professor Emeritus of University of Tokyo and Kochi Universities)

Akira Nagano (Executive Chair・Chair of All Japan Fishing Port Construction Association Institute)

Ryuichi Kuwashima (Guest Speaker・Division Manager, Kushiro Development Division, Hokkaido Department, Ministry of Land, Infrastructure and Transport)

Minoru Minatoya (Guest Speaker・Mayor of Rasu Town)

Research Presentations

Ocean・Water Quality/Biological・Fishery/Agriculture・livestock Related: 7 topics (Chair: Katsuhisa Yamada・DACCY Co.)

Health・Medical Related: 7 topics (Chair: Koji Otsuka・Osaka Prefecture Graduate School)

Utilization System Related: 7 topics (Chair: Hirohisa Kawakita・Kochi DOW Research Center)
Poster Presentation: 3 topics

Special Symposium: On Operation and Maintenance of DOW Facilities

Mod. Masahiro Sasaki (Silica Japan Hokkaido)
Takeshi Yamamoto (Hokkaido Development Bureau)
Hideki Yamaishi (Rausu)
Toyokazu Kanaya (Iwanai)
Tsutomu Kuromaru (Yakumo)
Shinichiro Kakuma (ODRC)
Yohei Nishioka (Muroto City)
Shinsuke Dema (Muroto City)

Fig. 3. Special Symposium

Closing Remarks
Kimio Fukami (Vice President of DOWAS・Professor/Special Assistant to the President, Kochi University)

Tour
①Rausu Fishing Port, Autumn Salmon Stationary Fishery
②Rausu Port Intake, Sanitation Management Port facility, Rausu Visitor Center, “Shiretoko/Rausu Crossroad”

【Participants】Members: 75, General: 30, Students: 3, Total: 130 (22 Staff)
(Participants from Korea and Taiwan also attended)

This convention was located in Hokkaido where three towns have intake facilities (Iwanai Town, Yakumo Town, and Rausu Town). Despite the remote location, the convention was grand with many participants. During the national user conference and special symposium “Discussion on Issues related to Utilization of DOW and Issues on Facility Maintenance Management” in the Hokkaido area was actively discussed. More than half the participants gathered for the “Fishing Port Tour” which occurred at 4 in the early morning. In addition to explanations by local volunteers, the explanation by Mayor of Rausu was very meaningful.

Finally, I would like to express my gratitude here for the cooperation of all the people of Rausu Town Office, the Venue Committee, and the Committee Members of the three towns for assistance in in the preparation and holding of the conference. I would also like to express my gratitude as the person responsible for organizing this conference to all our members for their daily understanding and cooperation on the activities of DOWAS. The next FY Conference will be in South Korea. Thank you for your cooperation in scheduling and participating.

Fig. 4. Rausu Fishing Port Tour (left is explanation by local volunteer)

2017 Taiwan DOW Resource Utilization Conference Report

Huang Ping-Yi (Director of Taiwan Society of Deep Ocean Water Resource Application)

The 2017 Taiwan DOW Resources Utilization Conference was held on October 30-31, 2017. In Taiwan, the awareness of DOW among ordinary citizens is low, so we hold this annual two-day event in Taipei City and at intake areas. On the first day, the event was held at the International Conference Hall of Taiwan University Conference Center where the formation of the DOW Industry Consortium of Taiwan and the 2017 DOW International Symposium were held. The next day, the general assembly and research presentations were held in Hualien at the Dong Hwa University School of Environment. The total number of participants during the two days was about 300 people with 40 corporate groups. As part of the international exchange project, five members also participated including Masayuki Takahashi, Chairman of DOWAS for a lecture this year. As Executive Director of the Taiwan DOW Utilization Association, I would like to express my sincere gratitude to you all again.

Fig. 1. Members from various fields of industry, government, and academia at the formation of the Taiwan DOW Industry Consortium. From the left, Stone and Resource Center President Lin Ching-Ming Lin, Eastern Cooperative Office Executive Director Juan-Sheng Hsu, Legislator Bi-Khim Hsiao, Industrial Development Bureau of MOEA Director Jang-Hwa Leu, Legislator Kawlo Iyun Pacidal, Taiwan DOW Development Association Chairman Li-Ai Huang, an Taiwan DOW Resource Utilization Association Chairman Jin-Yuan. Liu.

After the opening ceremony on the first day, the formation ceremony of the Taiwan Deep Seawater Industry Consortium, comprised of the Taiwan DOW Development Association, Ministry of Economy Affairs (MOEA), Taiwan DOW Utilization Association, the Stone and Resource Industry Research and Development Center, and other industry, government, and academic societies. The opportunity for establishing this consortium comes after half a year of coordination after the DOW utilization policy was reviewed and it was determined after last year's change of government that strengthening industry-government-academia collaboration to disseminate resource use was necessary. After the formation ceremony, the MOEA announced specific policies such as the early solution of domestic laboratory water intake issues, research and development support system for enterprises, industrial park development, industrial environment and research support, etc., toward a goal of economic scale ten times larger than the current situation within ten years.

Fig. 2. Special Guests and Speakers on the first day

Next, Mr. Benjamin Martin of Xenesys Inc. (Japan) presented a keynote lecture entitled "The Kumejima Model:

An Island Approach to Self-sufficient and Sustainable Communities," followed by Professor Chiang-Ting Chien of Taiwan Normal University presenting on the health effects of dissolved organic matter in DOW, and Professor Hiroaki Takeuchi of Kochi University introducing research results in the field of medicinal use of DOW for improved intestinal environment.

The afternoon's theme of Ocean Thermal Energy Conversion (OTEC) was moderated by Taiwan University Professor Emeritus Nai-Kuan Liang, with presentations from Japan (President of Xenesys Inc. Sadayuki Jitsuhara), the USA (Professor Luis Vega of Hawaii University), South Korea (Dr. Hyun-Ju Kim of KIOST), and Taiwan (Taiwan University Professor Emeritus Nai-Kuan Liang) on the progress of each country. While Japan and the United States are leading the world in OTEC use, Korea also seems to have a national policy in place for OTEC development, with an ongoing MW-class project for Kiribati. Compared with that, while Taiwan has a good location for use of OTEC, development has stalled. Overcoming this, is likely to be the biggest challenge for disseminating DOW use in Taiwan.

The next morning, after moving to Hualien, Kenji Nishio from Kochi Prefecture's DOW Promotion Department and Dr. Deok-Soo Moon, department head of South Korea's KIOST introduced the latest status of DOW use in Japan and Korea. In the afternoon, the general meeting was held with four researchers from Taiwan. In addition to the local Taitung University, we also introduced use by Taiwan Ocean University, Hungkuang University of Science which used DOW in cultivation of *Cordyceps Siensis*, salt refine, vegetable pickling and Taipei Medical University's utilization of the raw water's ability to preserve and the improvement of cardiovascular damage due to dissolved organic matter. Currently, the research on food use and in health and medical fields is gaining in popularity as reflected in the ongoing lead of DOW use in Taiwan by private enterprises.

Fig. 3. Venue on the first day

Fig. 5. Photo of guests and presenters at the Hualien Venue

Fig. 4. Greeting from Chairman Takahashi at the Hualien Venue on the second day

On Participation in the 4th Korean International DOW Symposium

Masayuki Takahashi (President of DOWAS)

In the afternoon of November 2, 2017 (13:00-18:30), the 4th Korean International DOW Symposium was held in the northeastern part of Korea in Gangwon Province Geoseong County. This time, Dr. Daisuke Fujita (Tokyo University of Marine Science and Technology) and myself from Japan, Dr. Huang Pnig-Yi (Taiwan Stone & Resource Industry R & D Center, DOWAS Member) from Taiwan, and Mr. Zu Fu Huang (Savers Holdings in NELHA Hawaii) from the United States were invited to give keynote speeches. In addition, there were seven oral presentations and 5 poster presentations from South Korea. Dongguk University Medical School's Professor Kyung Soo Nam's presentation was impressive as he studied the effect of DOW on the human body from a variety of perspectives.

The venue for this conference was the National Assembly Goseong Training Institute, which is a training hall for parliamentarians with a capacity of 321 guests in 78 rooms, with a permanent stage in a lecture hall that can accommodate 500 people. The building is at the top of a hill surrounded by the natural scenic environment and hardwood trees. The purpose of the symposium was to "understand DOW correctly and promote interest" and to that end, government and academia in Korea, officials from the Ministry of Maritime Affairs and Fishery (a national agency integrating the coast guard and fisheries agencies, etc.), Governor of Gangwon Province, political parties, and Korean citizens participated. Among the roughly 200 participants were about 40 undergraduate students of Kyung Dong University's DOW department. The lectures were in either Japanese or Korean and both were simultaneously translated. At the entrance venue, products such as drinking water makgeolli (Korean sake), soy sauce, cosmetics, dried cod, etc. using DOW were displayed.

After the lecture, the keynote speakers were invited to the stage for a question and answer session moderated by Professor Jesun Uh of Kyung Dong University, where many participants gave active questions and opinions. Afterward, a social gathering was held with many of the participants at the institute's cafeteria.

This symposium has been held three times previously. The contents of the keynote lectures are as follows.

First Symposium (Held September 13, 2006)

Yasumasa Igarashi (Director, Shizuoka Fuji Nutrition Research) Present State of DOW Utilization in Shizuoka

Seikichi Kaneshima (Senior Researcher, Okinawa Deepsea Research Center) Present State of Okinawa DOW Utilization

Yoshizumi Asakawa (Chairman, Kochi DOW Companies Club) Present State of Kochi DOW Businesses

Yukinori Saeki (General Manager, Gosho Pharmacuticals, Toyama) Present State of Toyama DOW Businesses

Second Symposium (Held October 1, 2008)

Kazutoshi Okamoto (Section leader, DOW Research Section, Shizuoka Fisheries Research Institute) Current State of DOW and it's Use in Shizuoka

Atsushi Omichi (Chairman, Kumejima DOW Council) Current State and Use of DOW in Okinawa

Minoru Minatoya (Chairman, Shiretoko Rausu DOW Utilization Council) Current State and Use of DOW in Hokkaido

Da Zhen Su (Professor, National Taiwan Maritime University) Current State and Use of DOW in Taiwan

Dale Joo (President, Savers Holdings ltd. Hawaii, USA) Current State and Use of DOW in Hawaii

Third Symposium (Held November 24, 2016)

Toshimitsu Nakashima (Former NPO Representative, DOW Association of Japan, Former Professor, Kyung Dong University) Use of DOW – New Developments

Motonori Yamamoto (Chairman, Kagoshima DOW Association) Ocean DOW Project – On the Kagoshima System

Shinichiro Kakuma (Director, Okinawa DOW Research Center) Okinawa DOW Research and Fishery Use

Fourth Symposium (Held November 2, 2017)

Masayuki Takahashi (Professor Emeritus, University of Tokyo, President, DOWAS) DOW: Huge New Resources Supporting the Next Generation

Daisuke Fujita (Tokyo University of Marine Science and Technology Associate Professor) Seaweed Culture Using DOW

Huang Pnig-Yi (Director, Taiwan Stone & Resource Industry R & D Center) Current State and Future Prospects of DOW Resource Utilization in Taiwan

Dale Joo (President, Savers Holdings Ltd. Hawaii, USA) National Energy Laboratory of Hawaii Authority (NELHA)

On the morning of November 3, I visited Kyung Dong University and the nearby DOW intake facilities and industrial complex. The university is a private school founded in Sokcho City and Geoseoung County in 1981. It recently opened a campus near Seoul with an approximate total number of students at 7200. In March 2005, the DOW Department (only undergraduate with a maximum of 30 students per year) was established. The department chairman is Professor Uh Jesun with three full-time faculty. Dr. Toshimitsu Nakashima, a member of DOWAS, served as a professor from 2006 to 2009. The male to female ratio of students is about 5 to 1, mostly from Seoul. The employment rate after graduation is 100%, mostly in companies conducting water quality analysis, environmental investigation, consulting, etc. The graduate school advancement rate is about 10% with students going to other schools or universities. The DOW department has a faculty fusion course targeted at social workers (tuition fee is paid by the nation), with 20 people accepted each year with education occurring through night and weekend courses. A DOW exhibition corner (floor space of about 100m^2) is set up on the first floor of the DOW permanent educational institution in the university. A comprehensive explanation of DOW, equipment, and laboratories for DOW is maintained.

About five kilometers north of the university, in the Songji Lake District, is the Gangwon DOW Co. which was established in December 208 as a joint public private entity (60% Daikyo Co., 20% Gangwon Province, 20% Goseong County). An armored HDPE pipe (Furukawa Electric Works CO.) with an outer diameter of 350mm (inner 270mm) and length of 6km is laid (construction by Shimizu Co.) to a depth of 605m draws about 3,000

tons per day of seawater. Of the intake capacity, 1200 tons are used in the Gangwon Fisheries Research Institute which is about 1km along the coast, with 500 tons in the First Industrial Park within 1km of the intake. Gangwon DOW Co. desalinates about 700 tons for drinking water. In addition, part of the DOW is piped and supplied to the Korea Research Institute of Ships and Ocean Engineering (KRISO), newly established in 2005, adjacent to Gangwon DOW Co. The price of DOW for the fisheries research institute is 20 million won per month (about 2 million yen), 5000 won (500 yen) per ton within the industrial district, and a 10,000 won (1000 yen) per ton for direct purchase at the intake.

When desalinated drinking water made from DOW was booming in Japan in the mid-1990's, several companies planned drinking water projects in Korea, but at that time, the beverage use of DOW was forbidden by law. It seems that many private companies lost their interest by the time the law was amended five years ago. Gangwon DOW Co. started selling their water in a unique 350ml PET bottle, which is easy to grasp by hand, in 2012. They now produce 6.4 million bottles per day. The selling price for members is 400 won (about 40 yen) or 1000 won (100yen) generally. Gangwon DOW Co. has annual sales of 17 billion won (1.7 billion yen) for drinking water sales, 8 billion won (800 million yen) as raw or concentrated water, and a total of 25 billion won (about 2.5 billion yen). The bottle size was decided on the basis of the amount of drinking water Asians drink when thirsty, and innovations such as the adoption of unique plastic bottles were seen everywhere. In Korea, the use of DOW in other foods or drinks is still restricted by law, so it seems it will take some time for change.

At the Gangwon County Fisheries Research Institute, seedling production of salmon and pollock is carried out using the low temperature and cleanliness of DOW. Walleye pollock is a popular fish in Korea and is used in various foods with consumption of around 250,000 tons per year, but with domestic catches of less than 3 tons per year. The majority is imported from Russia. For this reason, the Korean government has been developing the "Pollock Reserve Resource Recovery Program" since 2014, under which it promotes the development of complete aquaculture technology. As a result, they have devised the feeding environment of Alaska pollock, developed feed for seedlings and maturing fish, obtained fertilized eggs from wild stock, and brought up a second generation. The Korea Fisheries Ministry confirmed the maturity of the second generation and announced on October 10, 2016 it had developed the basic technology for the complete cultivation of Alaska Pollock. In the natural environment, it was observed to take 3 years for the fish to mature after hatching, however, through artificial farming they were able to shorten the cycle to 1 year and 8 months. Currently, the laboratory produces 1 million seedlings a year, but the seedlings are released and left to grow in the natural environment (cultivation fishery). The laboratory is under expansion to increase the scale of seed production and grow out. At the same time, it seems the research institute plans to lay out its own DOW intake pipe.

The First Industrial Park, developed by Goseong County about eight years ago is about 100km^2 in size and was sold only to companies using DOW in ~1.7km^2 parcels. Already 25 companies have purchased all the available land. The county is now developing a second industrial park adjacent to the first. Companies produce dried cod, mentaiko, bittern, etc. The Dry Cod Manufacturing Co. President Kim (female) is a Doctor of Literature and is currently studying a commercial course at Kyung Dong University's DOW department.

In South Korea, cold water fish and shellfish, such as snow crab, cricket crab, and cod are very popular. In such DOW plays a big role. Especially off Sokcho City, 10km south of Gangwon County where we visited this time is

Ulurun Island, but unfortunately there was no time to visit.

With the circumstance that use of DOW for food and drink being forbidden by law in South Korea, business use was mostly impossible. However, with the change of law allowing use for drinking water, it is possible for other uses to become legal in the future. This time, visiting the northeastern coast of Korea, DOW intake is suitable given the proximity of depth, and there are considerable plains near shore. It seems easier to create industrial parks and ease the utilization of DOW. Although it is far from the big cities, it is easy to transport goods overland with good roads and within 2-300km from Seoul and Busan. Some railway is also available. I felt there is great potential for DOW utilization development.

Information on the utilization of DOE in South Korea can be found in the following documents.

Ryosuke Tomimatsu. 2002. Trends of DOW Use in South Korea. JADOWA News, 6(1)15.
Toshimitsu Nakashima. 2008. Current State of DOW Use in South Korea. DOWAS News, 11(2):39-42.
Uh Jesun. 2010. Current State of Development and Utilization of DOW Resources in South Korea. Deep Ocean Research,11(1):39-42

Organizers and keynote speakers of the 4th Korea International DOW Symposium.
Fourth person from the right is Professor Uh Jesun (Photo by Mr. James Yoon)

China Deepwater Energy Conference 2017

Masayuki Takahashi (President of DOWAS)

This conference was held at the Hilton Hotel in Haikou City, Hainan Island, China on November 23 and 24, 2017. I had the opportunity to attend so will share an overview.

In mid-September 2017, the DOWAS Secretariat received an email request from Professor Wang Lei of Dongbei University in Shenyang City for a presentation on Japan's DOW efforts at the conference. Since I had no previous engagements scheduled, I accepted and received a formal invitation from the conference secretariat's Zhang Xiaojuan researcher at the end of October and decided to attend.

The conference is the third annual, being held at the Hilton Hotel in Haikou City at the same time each year with the first held in 2015. The organizer is sponsored by Hainan Province People's Government, China Process Institute, China Marine Petroleum Group, China Institute of Industry, and other academic and government organizations. Among the nearly 1000 participants were three from Japan, about ten each from Taiwan and South Korea, several from India and the United States, with most from China with an atmosphere like a domestic rally. On the first day in the morning, following an opening ceremony, four keynote lectures (each 20 minutes) and a panel discussion by five experts was held for about an hour. In the afternoon there were 8 subgroups with oral presentations of 20-35 minutes in length on Deep Sea Natural Gas Exploration (11), Deep Sea Mining Technology (32), Deep Sea Oil Field Excavation Techniques (15), International Underwater Association (SUT) (34), Deep Sea Wells (27), Marine Environment (8), International DOW (7), and Offshore Floating Structures (13). The numbers in parentheses indicates the number of presentations.

This year was the first time the International DOW Subgroup operated jointly under the National Oceanic Bureau Tianjin Seawater Desalination Research Institute and the Hainan Province Natural Energy and Environmental Technology Research Institute. In FY2017 they received a DOW research fund for three years, with the second subgroup expected next year. At the subgroup, three people spoke on the situation of DOW utilization from Japan (myself), Taiwan (Professor Chen Hui, National Cheng Kung University), and China (Senior Researcher Huang Xiping, Tianjin Institute of Desalination and Seawater Utilization). Afterward, Masanori Oishi, Section Leader, Selemion Technology Section, Membrane Division, Asahi Glass Co. spoke on extracting minerals from seawater via electrodialysis, followed by Professor Dr. Choi Min (Kunlun Medical University) on the medical effect of DOW, and an introduction of deep seawater intake technology by the head researcher at the Seawater Desalination Research Institute. Although professor Choi's work is inland, he takes seawater samples from Hainan Island which is more than 1000km away to carry out experiments. He is conducting his own research after investigating the results of DOW research on health and medical care in Japan and Taiwan.

China Deepwater Energy Conference 2007 Conference Site

In addition, at the Deep Ocean Drilling Technology Subgroup, there were lectures such as an Outline of OTEC, Power Generation Capacity in Chinese Territorial Waters, OTEC Power Generation Efficiency, Floating Technologies for OTEC Power Generation, and 2 topics on Large Diameter Intake Pipes.

China's ability to obtain DOW within territorial waters is limited to the South China Sea. Within the South China Sea, the economic zones of Hainan Province are 2 million km^2 accounting for 2/3 of the total economic zone in China, more than 70% of which have water depths of 200m or more and have abundant DOW resources. In the case of Hainan Island, however, intake is not easy due to the 71km distance to a depth of 200m.

This time, the two research institutes in charge of the DOW Conference are promoting DOW Use through the acquisition of research expenses. I was impressed that the use of seawater as an ingredient was central. Energy use of DOW, including OTEC, is being promoted by other institutions.

More than 50% of the current power generation in China is coal-fired, however it was stated strongly in a keynote that in the next few years China will switch to natural gas and natural energy. Given this situation, the development of offshore OTEC in the South China Sea may progress. I am looking forward to future developments.